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Needs-Based Targeting or Favoritism? The Regional Allocation of Multilateral Aid within Recipient Countries*

Hannes Öhler and Peter Nunnenkamp

Abstract:
The regional allocation of aid within recipient countries has been largely ignored in the aid allocation literature. We use geocoded data on the location of aid projects financed by the World Bank and the African Development Bank within a sample of 27 recipient countries to assess the claim of donors that their aid targets needy population segments. We also assess whether political leaders in these countries direct aid funds to their home region, irrespective of regional needs. We do not find that the multilateral aid institutions take regional needs into account. Instead, favoritism appears to play an important role for location choices, in particular for physical infrastructure projects.

Keywords: aid allocation, within-country targeting, favoritism, World Bank, African Development Bank.

JEL classification: F35, F53

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1. Introduction

While the allocation of foreign aid has received a lot of attention in the literature, almost all empirical studies consider recipient countries as a whole as their unit of observation, ignoring regional heterogeneity within these countries. The literature focuses on whether donors allocate aid to relatively poor and well governed recipient countries, or whether their aid is motivated by economic and political ties between donor and recipient countries. Recent examples include Berthélemy (2006), Dollar and Levin (2006), Claessens et al. (2009), Thiele et al. (2007), Fleck and Kilby (2010), and Hoeffler and Outram (2011). In sharp contrast, very limited evidence exists on the allocation of aid within recipient countries.[1] This leaves an important gap in the literature on aid allocation.

Donors often claim that they continue granting aid to countries with rising average incomes in order to help alleviate persistent poverty in large segments of the population. For instance, the German Minister for Economic Cooperation and Development deemed aid to "regional giants as China, India or Brazil [to be] necessary" as most people living in absolute poverty are to be found in these countries, rather than in lower-income countries (Wieczorek-Zeul 2005).[2] The regional allocation of aid within recipient countries could offer relevant insights to assess such donor claims. At the same time, the regional allocation of aid may reveal personal, regional and ethnic favoritism in the recipient countries. In particular, political leaders in these countries may direct aid funds to their home region, irrespective of local needs.[3] Hodler and Raschky (2011) provide indirect evidence for this proposition by analyzing the effect of foreign aid measured at the country level on nighttime light across regions.[4] However, the fact that most donors do not disclose the precise location of their aid

[1] Zhang (2004) and Nunnenkamp et al. (2012) assess the allocation of World Bank projects across Chinese provinces and Indian districts, respectively.
[2] See also the blog by Andy Sumner and Ravi Kanbur for a justification of aid to middle-income countries: http://www.guardian.co.uk/global-development/poverty-matters/2011/feb/23/aid-to-middle-income-countries (accessed: March 2013).
[3] See Hodler and Raschky (2011) for various reasons of favoritism.
[4] Specifically, using satellite data on nighttime light, Hodler and Raschky (2011) show that Mobutu Sese Seko, the former dictator of Zaire (now the Democratic Rep. of Congo), was extremely "successful" in directing funds

projects renders it difficult to analyze the poverty orientation of aid allocation within recipient countries.

We contribute to closing this research gap by analyzing the regional allocation of aid projects financed by the World Bank and the African Development Bank (AfBD) in a sample of up to 27 recipient countries. We make use of AidData's geocoding of projects of these multilateral institutions in various recipient countries.[5] These project- and location-specific data are matched with regional indicators revealing the geography of need for aid (infant mortality, maternal health and malnutrition).[6] In addition, we use regional data on violent conflicts for a sub-sample of 17 African countries. The geography of need and conflict allows us to assess whether the World Bank and the AfBD allocated aid in line with the predominant view that aid tends to be more effective in poor environments with relatively favorable governance conditions (World Bank 1998). Finally, we performed a search of the birthplaces of political leaders of the 27 sample countries to capture favoritism.

Taken together, these data allow us to test three major hypotheses: First, multilateral donors are likely to grant more aid to needier regions with higher infant mortality, worse maternal health and more serious malnutrition. Second, multilateral donors can be expected to grant more aid to regions where governance conditions tend to be better due to lower prevalence of violent conflicts. Third, regions where political leaders were born are likely to receive more multilateral aid.

The subsequent section describes the data in more detail, offers some stylized facts, and introduces the estimation approach. We present our empirical results in Section 3. We do not find any evidence supporting the claim of donors that their aid allocation takes regional needs into account. Conflicts tend to discourage World Bank projects, though not AfDB projects. Favoritism appears to play an important role for project locations within the

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to his home region. For other examples of favoritism, e.g., in Bolivia, Kenya and Zambia, see the sources given in Hodler and Raschky (2011).

[5] The link to the databases is as follows: http://open.aiddata.org/content/index/geocoding.

[6] These data are available from http://maps.worldbank.org/content/country; see Section 2 for details.

recipient countries, even though there are differences between major sectors of aid (such as physical or social infrastructure). Section 4 summarizes and concludes.

2. Data and method

As noted above, detailed information on the location of World Bank and AfDB projects is available from AidData. AidData's geocoded database on World Bank projects lists 365 projects that were approved since 2005 and were still in operation as of September 2011 in 27 recipient countries. Regional indicators of need are available from Demographic and Health Surveys (DHS) for these recipient countries (see below).[7] The sample for the World Bank includes a few Asian and Latin American countries, but it is clearly dominated by (19) Sub-Saharan African countries.[8] Except for Madagascar, the database on AfDB projects lists 69 projects that were approved in 2009 or 2010 for the Sub-Saharan African subsample, independently of whether the projects were still ongoing or already completed as of September 2011. The number of project locations (6,899 for World Bank projects and 945 for AfDB projects) is much larger than the number of projects as most projects cover various locations within a recipient country (and occasionally even within neighboring recipient countries).

Appendix B shows the sectoral breakdown of World Bank projects in all sample countries. Projects in physical infrastructure figure most prominently, notably in transportation and energy (including mining). Social infrastructure and production sectors account for most of the remaining World Bank projects. The sectoral breakdown of the much smaller number of AfDB is not shown as it is not used in the estimations below. It may be noted, however, that the breakdown is similar to that of World Bank projects in that AfDB projects in physical infrastructure represent the most important group (36 of all 69 projects).

[7] See Appendix A for details on World Bank and AfDB projects in the sample countries.
[8] However, 80 out of all 365 World Bank projects in the sample are located in India, followed by Kenya (22) and Bangladesh (21).

Taken together, all projects included in the subsequent analysis add up to financial commitments of US$37.3 billion by the World Bank and US$4.4 billion by the AfDB (Appendix A). World Bank projects are, on average, significantly larger than AfDB projects (US$111 million and US$65.5 million respectively).[9] At the same time, World Bank projects are spread over a higher number of project locations than AfDB projects (18.9 versus 13.7 locations per project). It is important to note that the databases do not provide the regional breakdown of the overall amount of project-related commitments. Therefore, we take the number of project locations within a particular region of the sample countries as our dependent variable in the subsequent analysis.

The term "region" used for our analysis refers to the regional breakdown applied by the DHS. For instance, the "DHS regions" in India relate to the level of states (including Delhi as a Union territory). We include all regions for which the DHS conducted in our 27 sample countries provide information on indicators of need (*infant mortality*, *maternal health*, and *malnutrition*). The DHS do not necessarily cover the whole country. Consequently, the number of regions per country ranges from just two (Madagascar) to 29 (India). All in all, we include up to 254 regions in our estimations for World Bank projects (149 for AfDB projects).[10]

The three indicators taken from the DHS are used to test our first hypothesis according to which multilateral donors grant more aid to needier regions. The literature on aid allocation at the country level typically uses average per-capita income as an indicator of need. This measure is rarely available at the regional level. Among the three DHS indicators, *infant*

[9] This difference is mainly due to particularly large World Bank projects in India. In these calculations, we did not consider the few projects for which commitments are missing or given as zero.

[10] It should also be noted that project locations as given by AidData do not necessarily relate to the DHS regions. For some countries (e.g. Nigeria), the administrative regions "ADM1" used by AidData are more disaggregated than the DHS regions. In various other instances, project locations refer to finer regional divisions ("ADM2" or an exact location such as a populated place). We used this information and aggregated these project locations at the level of DHS regions. In some other instances, the project location given by AidData refers to an entire country. The location may also refer to parts of a country greater than a region or lie between populated areas, along rivers or borders, etc. so that it cannot be assigned to a specific region. These project locations have to be omitted in the following.

mortality is our preferred measure of need – not least because the rate of infants dying before reaching one year of age, per 1,000 live births, has been widely used in the previous literature.[11] This rate exceeds 100 in various regions in the sample, notably in several African countries.[12] At the same time, the variation within countries is often large. For instance, *infant mortality* in Mozambique ranges from 51 to 177. A similarly large difference prevails between Ghana's Upper West (32.5) and Upper East (105). The gap within India is still wider, comparing Kerala (17.7) and Uttar Pradesh (83).

We use the number of conflict-related deaths per 100,000 inhabitants (*conflict deaths*) to assess our second hypothesis that multilateral donors grant more aid to regions where governance conditions tend to be better. Annual data on *conflict deaths* are available on a regional basis from the Uppsala Conflict Data Program (UCDP), though only for 17 out of the 27 recipient countries in our sample.[13] This indicator is clearly insufficient to provide a comprehensive picture on regional governance conditions. Nevertheless, it helps assess whether multilateral donors take into account that, by giving rise to instability and insecurity in affected regions, violent conflicts are likely to erode the viability and sustainability of aid projects. In just four of 17 African countries (Cameroon, Lesotho, Liberia and Zambia), no conflicts with at least one death occurred in the 2005-2010 period. At the other extreme, conflict-related deaths per 100,000 inhabitants sum up to 82 in the region Nord-Kivu of the Democratic Republic of the Congo in 2009.

We collected the names of the relevant political leaders in all 27 sample countries as well as the timespan they were in power, covering the 2000-2011 period.[14] On this basis, we

[11] For instance, Lensink and White (1999: 30) argue that social measures such as the infant mortality rate are "both a poverty indicator in its own right, and highly correlated with income poverty."
[12] See Appendix C for summary statistics as well as Appendix D for definitions and sources.
[13] Note also that these data are only available until 2010.
[14] This information is available from: http://www.rulers.org/. Depending on the political system in the country, the relevant political leader is either the President or the Prime Minister.

conducted an internet search to identify their birthplaces.[15] Finally, we assigned the birthplace to the appropriate region to assess our third hypothesis that favoritism is likely to matter for the location of projects. Specifically, *birthplace leader* takes the value of one for regions and years when the political leader in power was born in that particular region.[16] For 38 of all 254 regions covered in the subsequent analysis with cross-sectional data of World Bank projects in the 2005-2011 period we identify at least one political leader born in that region.[17] Three examples reveal the different patterns we observe in our sample: In the case of Uganda, President Museveni held power throughout the period of observation so that his region of birth, the South West of Uganda, persistently receives a value of one. In the case of Nepal, political leadership changed repeatedly and several regions receive non-zero values of *birthplace leader* for specific timespans of the period of observation. By contrast, *birthplace leader* takes values of zero for all regions and years in Armenia whose political leaders during the period of observation were born abroad (in Azerbaijan).

In all estimations, we control for the number of people living in a particular region (in log). Population represents an important control variable as projects are likely to be concentrated in more populated regions. However, the positive coefficient of population is expected to be smaller than one as cross-country studies on aid allocation typically find that aid increases less than proportionally with population.[18]

We follow Nunnenkamp et al. (2012) and perform Poisson Pseudo Maximum Likelihood (PPML) estimations to assess the determinants of the number of project locations at the regional level. Poisson regression models are generally appropriate when the dependent

[15] We follow Hodler and Raschky (2011) in this regard. As noted above, Hodler and Raschky (2011) find indirect evidence of "aid-fueled favoritism" of political leaders.
[16] More precisely, the variable may vary between zero and one to account for the possibility that a political leader born in a particular region was in power for only part of a year (the proportion of months is used as weights).
[17] In the yearly data, *birthplace leader* is non-zero for 174 out of 1778 observations.
[18] The coefficient on population can be interpreted as elasticity since population is in log and in the case of the Poisson model specified below.

variable takes non-negative values and is skewed.[19] The expected number of project locations is given by:

$$E(y_i \mid x_i) = e^{x_i'\beta}$$

As described above, our independent variables refer to the regional level. However, we include country fixed effects in our estimations to account for heterogeneity at the level of recipient countries. To allow the errors to be correlated within countries we use cluster-robust standard errors.[20]

In the basic Poisson model, the dependent variable is defined as the number of project locations within one particular region of a recipient country for all World Bank projects approved during the 2005-2011 period (or, alternatively, for all AfDB projects approved in 2009/2010).[21] The sample of projects tends to be skewed increasingly towards longer-term projects the further one goes back in time by including World Bank projects approved in earlier years. Moreover, as noted above, going back in time and including projects approved in earlier years is not possible for AfDB projects. This is why we test below whether the results for World Bank projects are affected when the estimations are performed for different time intervals.[22] For these Poisson estimations with cross-sectional data, we average *birthplace leader* and sum up *conflict deaths* over the period of observation.[23]

In order to estimate the effect of *birthplace leader* more precisely, we also perform two sets of analyses with panel data in subsequent steps. First, we slice the project data by the year of approval. The dependent variable is then defined as the number of project locations

[19] Note also that the PPML estimator allows for over- and under-dispersion, i.e., the conditional variance of the dependent variable does not have to be equal to the conditional mean (see, e.g., Santos Silva and Tenreyro 2006).
[20] Alternatively, standard errors are clustered by region in the year-specific or project-specific approaches described below.
[21] World Bank projects of 2011 are only covered if they were approved before July/August (since the geocoded data were released in September 2011).
[22] More precisely, we perform robustness tests below by considering all World Bank projects approved since 2000, 2008 or 2010.
[23] The need indicators and population are constant over time because yearly data of these variables are not available.

for projects approved in year *t* (*t* = 2005, …, 2011 for World Bank projects; *t* = 2009, 2010 for AfDB projects). Likewise, we use yearly data for the variables *birthplace leader* and *conflict deaths*. Second, we consider the number of project-specific locations within a region; i.e., we replace the time dimension by the finer project dimension. In this case, the variable *birthplace leader* identifies the leaders who were in office at the exact date of the project approval.

3. Results

Estimations with cross-sectional data

We present our basic Poisson estimation results in Table 1 for World Banks projects approved in 2005-2011 and in Table 2 for AfDB projects approved in 2009-2010. As noted in Section 2, *infant mortality* represents our preferred indicator of need in columns 1 and 4 of Tables 1 and 2. Alternatively, we consider *maternal health* – i.e., the share of births attended by skilled staff – in columns 2 and 5, and *malnutrition* – i.e., the share of malnourished children under age five – in columns 3 and 6 of Tables 1 and 2. The estimations shown in columns 1-3 of both tables exclude *conflict deaths* which is only available for part of our sample of recipient countries. Recall that all estimations include country fixed effects to control for heterogeneity at the level of recipient countries.

Irrespective of the exact specification, in the estimations for both World Bank and AfDB projects, the coefficient on the regions' population is significantly positive at least at the five percent level. Moreover, it appears that the number of project locations increases less than proportionately in more populated regions, as was to be expected from traditional cross-country studies on the allocation of aid.

More strikingly, World Bank projects and AfDB projects resemble each other in that their allocation within recipient countries seems to be completely detached from regional needs. In sharp contrast to claims that aid targets needy population segments, we do not find any evidence that regions with higher infant mortality receive a larger number of multilateral

aid projects. This surprisingly bleak picture remains the same when our preferred indicator of need, *infant mortality*, is replaced by either *maternal health* or *malnutrition*. While the signs reported for these variables may even point to an anti-poverty bias of location choices, the coefficient never comes close to be statistically significant at conventional levels.

Before assessing whether the complete absence of needs-based targeting is robust to sector-specific refinements of aid projects, our two remaining hypotheses deserve attention. As concerns favoritism, there are strong indications that regions where political leaders were born are more likely to receive World Bank and AfDB projects. The coefficient of *birthplace leader* proves to be significantly positive at the five percent level for World Bank projects in all 27 sample countries (columns 1-3 of Table 1). Quantitatively, the difference in the number of project locations between a region where a leader (in office throughout the period of observation) was born and a region without a birthplace of a leader is, on average, four project locations (corresponding to 0.11 standard deviations).[24]

The coefficient on *birthplace leader* is no longer significant in the extended specification for the reduced sample of 17 recipient countries of World Bank projects (columns 4-6 of Table 1). In additional estimations, we excluded *conflict deaths* for the reduced sample of 17 recipient countries. According to the results (not shown), whether or not the coefficient on *birthplace leader* is significant depends on the size of the sample, rather than the extension by *conflict deaths*. Recalling that the reduced sample is restricted to African countries, it appears that favoritism plays a minor role for the location of World Bank projects in Africa, compared to Asia and Latin America.

Table 2 reveals that favoritism is relevant for the location of AfDB projects. This is in some contrast to the pattern for World Bank projects, considering that all AfDB projects are located in Africa. The effect of *birthplace leader* on the number of AfDB project locations proves to be significantly positive, though only at the ten percent level, in all estimations, i.e.,

[24] The quantitative effect is the difference between with *birthplace leader*=1 and with *birthplace leader*=0 at the mean of the other independent variables.

irrespective of whether the specification includes *conflict deaths* as an additional independent variable. In quantitative terms, the difference between a region where a leader (in office throughout 2009 and 2010) was born and a region without a birthplace of a leader is 2.2 project locations (0.16 standard deviations).[25]

Finally, Tables 1 and 2 present ambiguous evidence on the hypothesis that multilateral institutions prefer locations where governance conditions tend to be better as indicated by lower prevalence of violent conflicts. The results in columns 4-6 of Table 1 appear to support this hypothesis. The effect of *conflict deaths* on the number of World Bank project locations is significantly negative at the one percent level. Quantitatively, an increase in *conflict deaths* by one standard deviation (15.0 conflict-related deaths per 100,000 inhabitants) leads to a decrease in the number of project locations by 1.7 (0.08 standard deviations).[26] In contrast to World Bank projects, the number of AfDB projects is not affected by *conflict deaths* in a significant way (columns 4-6 of Table 2).

It remains open to question what exactly we capture with *conflict deaths* since other indicators of governance conditions at the regional level are not available for our sample of recipient countries. Possibly, the negative effect of *conflict deaths* in Table 1 reveals that World Bank projects are discouraged primarily by acute security concerns, rather than persistently bad governance conditions once violent conflicts have been resolved.[27]

Tables 3 and 4 present additional estimations with the cross-sectional data for World Bank projects. The considerably smaller number of AfDB as well as the short period of observation prevents us from performing comparable estimations for AfDB projects. In Table 3, we use the sector classification of World Bank projects introduced in Section 2 to test whether the determinants of location choices differ between major sectors. In a first step, we

[25] Note that the standard deviation as well as the mean of the dependent variable, i.e., the number of project locations, is smaller in the estimations for AfDB projects, compared to those for World Bank projects (see Appendix C).
[26] The marginal effect is calculated at the mean of the independent variables.
[27] We return to the different effects of *conflict deaths* on World Bank projects and AfDB projects below when presenting the estimations with panel data.

excluded all 42 projects related to public administration. One could have expected that the lacking needs-based targeting was due to the inclusion of projects in this sector as administrative bodies are mainly located in better developed centers of the recipient countries. However, the results in columns 1 and 5 of Table 3 are almost the same as in the corresponding columns 1 and 4 of Table 1. Most importantly, we still find no evidence for a needs-based targeting when projects in administration are excluded.

In the next step, we perform separate estimations for World Bank projects classified into three major sectors: production sectors (columns 2 and 6), physical infrastructure (columns 3 and 7), and social infrastructure (columns 4 and 8). It appears that the aggregate results in Table 1 are mainly driven by projects in physical infrastructure which accounts for the largest share of all World Bank projects (Appendix A). In particular, it is only for this sector that the coefficient on *birthplace leader* is significantly positive as long as the estimation is based on the full sample of recipient countries.[28] Favoritism has no significant effects on project locations in social infrastructure and production sectors. Arguably, large scale projects in physical infrastructure may be more likely to be affected by favoritism than relatively small projects in social infrastructure and production sectors. Likewise, the adverse effects of violent conflicts on the number of project locations in a region are significant only for projects in infrastructure. This may indicate that *conflict deaths* primarily captures the discouraging effects of insecurity which can reasonably be assumed to be particularly strong for capital intensive projects in energy, transportation and communication. Importantly, however, we find no evidence of needs-based targeting for World Bank projects in physical infrastructure, production sectors and social infrastructure.[29]

In Table 4, we test for the robustness of the results for all World Bank projects when considering different periods of approval. First, we extend the period under consideration by

[28] The sector-specific estimations exclude one or two recipient countries without any World Bank project in the respective sector.

[29] This also holds when our preferred indicator of need, *infant mortality*, is replaced by *maternal health* or *malnutrition* (not shown).

going further back to 2000 in order to consider almost all ongoing World Bank projects listed in AidData's database as of September 2011 (columns 1 and 4).[30] Second, we improve the comparability with AfDB projects and mitigate any bias toward longer-term projects by reducing the timespan of approvals to either 2008-2011 (columns 2 and 5) or 2010/2011 (columns 3 and 6). It is reassuring that the choice of longer or shorter timespans of approval has only minor effects on the baseline results reported for the 2005-2011 period in Table 1. As before *infant mortality* proves to be insignificant, independently of whether the period under consideration in columns 1-6 of Table 4 is longer or shorter than the benchmark. The effect of *birthplace leader* continues to be positive for the full sample of recipient countries, though the level of significance weakens to the ten percent level in columns 1 and 3. The evidence for the discouraging effects of *conflict deaths* does not hold when extending the period of observation (column 4), but remains as before when including only more recent approvals.

Estimations with panel data

The estimates with cross-sectional data appear appropriate to assess the hypothesis that multilateral institutions target needier regions within recipient countries. Recall that our indicators of need are not available on a yearly basis as the underlying DHS are typically conducted less frequently. By contrast, annual data on *conflict deaths* are available (until 2010); the same applies to *birthplace leader*. In the first part of this section, we use these annual data to provide more precise estimates, notably of the effect of *birthplace leader* on the number of regional project locations approved by the World Bank or the AfDB in a particular year ("year-specific approach"). In the second part, we turn from the annual perspective to a project-specific perspective (see below on the "project-specific approach").

We focus our attention on *conflict deaths* and *birthplace leader* in the following. However, it should be stressed that two previous findings prove to be robust in all estimations

[30] The database also comprises a few projects approved before 2000 and still ongoing as of September 2011. We do not make use of this information.

reported in this section. First of all, *infant mortality* never enters significant. In other words, the estimations with panel data corroborate the lack of needs-based targeting of multilateral aid as far as the regional allocation of World Bank and AfDB projects can tell. Second, our control variable *population* always enters significantly positive at least at the five percent level, and the number of project locations always increases less than proportionately in more populated regions.

The results of the year-specific approach for World Bank projects are shown in Table 5 and in Appendix E. Standard errors are clustered by region in Table 5 in order not to underestimate the standard errors of the time-invariant variables (*infant mortality*, *population*), while they are clustered at the level of recipient countries in Appendix E (as in previous estimations).[31]

Compared to the estimation results with cross-sectional data for World Bank projects in Tables 1 and 4, the estimations with panel data in Table 5 provide considerably weaker support to the hypothesis that favoritism matters for the location of World Bank projects. The positive coefficient on *birthplace leader* retains its statistical significance for just one timespan of approvals, namely the most recent years 2010/2011.[32] However, the evidence for a positive effect of *birthplace leader* on the number of project locations is comparatively stronger when standard errors are clustered by country (Appendix E).

Similarly, the year-specific approach supports the hypothesis that World Bank projects are discouraged by more violent conflicts only for relatively recent timespans. In particular, the significantly negative effect of *conflict deaths* for the 2005-2011 period does not carry

[31] Note that the estimations of the year-specific approach comprise year fixed effects.
[32] This estimation only allows for a relatively restricted correlation within clusters (regions) since the size of the clusters is limited to two observations.

over from the estimation results with cross-sectional data in Table 1 to the estimation with panel data in column 6 of Table 5.[33]

In some contrast to the results for World Bank projects, the findings for AfDB projects in Table 6 are hardly affected by the choice of clustering standard errors by region (columns 1 and 2) or by country (columns 3 and 4).[34] Most importantly, the coefficient on *birthplace leader* proves to be significantly positive in all four estimations reported in Table 6, though only at the ten percent level in columns 3 and 4. Hence, the estimations with panel data consistently corroborate the earlier estimation result with cross-sectional data that favoritism matters for the regional location of AfDB projects within our African sample countries. In addition, the year-specific approach offers the first indications that, in conflict with the hypothesis on violent conflicts and regional governance, the number of project locations may be correlated positively with *conflict deaths* for AfDB projects (also see below).

The second set of estimations with panel data differs in two respects from the previous year-specific approach. The dependent variable is now defined as the number of locations per region for each of the 365 World Bank projects in Table 7 (and Appendix F) and for each of the 69 AfDB projects in Table 8.[35] Furthermore, *birthplace leader* now identifies the leaders who were in office at the exact date of the project approval. This should ensure the most precise estimate of the effect of favoritism.

Indeed, Table 7 shows significantly positive coefficients of *birthplace leader* as long as the estimations are based on World Bank projects in the full sample of 27 recipient

[33] When including *conflict deaths* as an additional independent variable, the period of observation for the time-specific (and project-specific) approach ends with 2010 because data on *conflict deaths* are only available until 2010.

[34] It may be noted that is just by a small margin that *conflict deaths* enters insignificant in column 2, and significant at the ten percent level in column 4 of Table 6.

[35] In addition, the estimations include project fixed effects instead of year fixed effects. As for the year-specific approach, standard errors are clustered either by region (Table 7 as well columns 1 and 2 of Table 8) or by country (Appendix F as well as columns 3 and 4 of Table 8). Once again, the results for AfDB projects are hardly affected by this choice. As concerns World Bank projects, the evidence for favoritism is somewhat weaker when standard errors are clustered by country in Appendix F, which is different from the year-specific approach above. The subsequent presentation focuses on the estimations with standard errors clustered by region.

countries (columns 1-4). This finding resembles the estimation results with cross-sectional data in Tables 1 and 4. Compared to the year-specific approach, Table 7 provides stronger support to the hypothesis that World Bank projects tend to concentrate in regions where political leaders were born. As in all other estimations before, *birthplace leader* loses its significance when the sample is reduced to recipient countries with data on violent conflicts (columns 5-8). At the same time, both sets of estimations with panel data in Tables 5 and 7 reveal similar results on the effect of *conflict deaths*.

Table 8 reports the project-specific estimations for AfDB projects. First of all, these estimations strengthen the evidence that favoritism has significant effects on the location of AfDB projects. At the same time, Table 8 provides stronger evidence than before that, in the case of the AfDB, the number of project locations tends to be higher in regions with more violent conflicts. It cannot be ruled out that the positive correlation is due to reverse causation. For instance, Findley et al. (2011) find that aid has fuelled conflicts in three African recipient countries (Angola, Mozambique, and Sierra Leone). In the present context, however, this interpretation is not particularly plausible since we do not find a positive correlation between *conflict deaths* and the number of locations for World Bank projects. The striking difference between the two multilateral institutions suggests instead that the location choices of the AfDB are an attempt at conflict resolution.[36]

4. Summary and conclusion

We made use of AidData's geocoding of aid projects financed in various recipient countries by the World Bank and the African Development Bank to analyze major determinants of the regional allocation of aid within these countries. We combined the project data with

[36] In fact, the African Development Report 2008/2009 focuses on "Conflict Resolution, Peace and Reconstruction in Africa" (African Development Bank 2008). In 2008, the AfDB established a so-called Fragile States Facility with the objective to assist conflict-prone countries in their attempts to promote stability and economic development (See: http://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/fragile-states-facility/).

information on regional poverty indicators, violent conflicts, and the birthplaces of political leaders. This allowed us to test three hypotheses: First, we expected multilateral donors to grant more aid to needier regions with higher infant mortality, worse maternal health and more serious malnutrition. Second, following their own mantra that the effectiveness of aid depends on the quality of governance (World Bank 1998), multilateral institutions may have allocated projects to regions where a lower prevalence of violent conflicts indicated better governance conditions and allowed for a higher viability and sustainability of aid projects. Third, anecdotal and indirect evidence led us to suspect that regions where political leaders were born are more likely to receive more multilateral aid.

Most surprisingly perhaps, we do not find any evidence that the multilateral aid institutions take regional needs into account. This result is very robust: it holds for both the World Bank and the AfDB, for different indicators of need, different periods of project approvals (by the World Bank), for major sectors to which the (World Bank) projects belong, and for varying estimation approaches. Our findings are rather ambiguous with respect to regional governance and conflicts. There is some evidence that the World Bank prefers locations where conflict-related casualties are less frequent. By contrast, AfDB projects are not discouraged by conflicts; it even appears that the AfDB might have engaged in conflict resolution by locating projects in conflict-prone regions. Finally, our results indicate that favoritism plays an important role for location choices. As concerns the World Bank, location choices are most likely to be affected by favoritism for projects in physical infrastructure. Even though the sectoral disaggregation is not meaningful for the AfDB (due to the smaller number of observations), the aggregate picture for the projects of this institution consistently points to the role of favoritism.

Our study contributes to filling an important gap in the aid allocation literature, which has largely ignored the regional distribution of aid within recipient countries. However, multilateral aid accounted for less than 40 percent of total aid commitments from all sources

to the sample of 27 recipient countries in the 2005-2011 period.[37] Our findings for the World Bank and the AFDB do not necessarily carry over to the location choices for projects financed by bilateral donors. Moreover, it has been shown that member countries of the OECD's Development Assistance Committee (DAC) differ in their allocation behavior (see, e.g., Berthélemy 2006). Donors with a reputation of allocating aid more altruistically at the level of recipient countries may also provide better targeted aid when it comes to the allocation within recipient countries. Conversely, the political leaders of recipient countries may have more discretion in redirecting politically motivated aid from selfish donor countries. Hence, it would be highly desirable if the geocoding of aid projects covered an increasing number of multilateral and bilateral donors. This would allow for a more comprehensive assessment of donor claims and political realities with respect to aid targeting within recipient countries.

[37] Available from: http://stats.oecd.org/index.aspx?DataSetCode=CRS1# (accessed: March 2013).

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Table 1 – Basic PPML results with cross-sectional data: World Bank projects

	(1)	(2)	(3)	(4)	(5)	(6)
Population	0.557***	0.558***	0.563***	0.721***	0.724***	0.748***
	(0.0823)	(0.0788)	(0.0853)	(0.0964)	(0.107)	(0.116)
Infant mortality	-0.000723			-0.000962		
	(0.00275)			(0.00288)		
Maternal health		0.00250			0.000680	
		(0.00391)			(0.00428)	
Malnutrition			-0.00442			-0.00971
			(0.00536)			(0.00853)
Birthplace leader	0.287**	0.281**	0.280**	0.0690	0.0557	0.0760
	(0.126)	(0.123)	(0.120)	(0.144)	(0.131)	(0.140)
Conflict deaths				-0.0125***	-0.0124***	-0.0122***
				(0.00395)	(0.00393)	(0.00406)
Number of observations (regions)	254	254	254	136	136	136
Number of countries	27	27	27	17	17	17

Robust standard errors clustered at country level in parentheses; country fixed effects included; *** p<0.01, ** p<0.05, * p<0.1.

Table 2 – Basic PPML results with cross-sectional data: AfDB projects

	(1)	(2)	(3)	(4)	(5)	(6)
Population	0.579***	0.589***	0.581**	0.583***	0.596**	0.592**
	(0.221)	(0.226)	(0.231)	(0.226)	(0.234)	(0.239)
Infant mortality	-0.000926			-0.00106		
	(0.00620)			(0.00583)		
Maternal health		0.00286			0.00349	
		(0.00453)			(0.00427)	
Malnutrition			-0.00197			-0.00472
			(0.0155)			(0.0141)
Birthplace leader	1.029*	1.014*	1.026*	1.011*	0.992*	1.011*
	(0.541)	(0.544)	(0.550)	(0.582)	(0.587)	(0.590)
Conflict deaths				0.00910	0.00974	0.00973
				(0.00705)	(0.00756)	(0.00746)
Number of observations (regions)	149	149	149	134	134	134
Number of countries	18	18	18	16	16	16

Robust standard errors clustered at country level in parentheses; country fixed effects included; *** p<0.01, ** p<0.05, * p<0.1.

Table 3 – PPML results with cross-sectional data: World Bank projects in specific sectors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	W/o public administration	Produc-tion sector	Physical infrastructur e	Social infra-structure	W/o public administration	Produc-tion sector	Physical infrastructur e	Social infra-structure
Population	0.548***	0.878***	0.392***	0.593***	0.740***	0.805***	0.850***	0.556**
	(0.0842)	(0.0866)	(0.0696)	(0.168)	(0.114)	(0.201)	(0.158)	(0.259)
Infant mortality	-0.000743	-0.00217	-0.000155	-0.000603	-0.00168	0.00132	-0.00620	-0.00198
	(0.00294)	(0.00436)	(0.00306)	(0.00469)	(0.00299)	(0.00325)	(0.00501)	(0.00527)
Birthplace leader	0.278**	0.0519	0.783***	-0.204	0.0379	0.0749	0.352	-0.239
	(0.132)	(0.166)	(0.230)	(0.166)	(0.162)	(0.234)	(0.295)	(0.287)
Conflict deaths					-0.0133**	-0.00635	-0.0126***	-0.0152
					(0.00587)	(0.00895)	(0.00209)	(0.0127)
Number of observations (regions)	254	238	246	252	136	120	128	134
Number of countries	27	25	26	26	17	15	16	16

Robust standard errors clustered at country level in parentheses; country fixed effects included; *** p<0.01, ** p<0.05, * p<0.1.

Table 4 – PPML results with cross-sectional data: World Bank projects in different periods of approval

	(1) 2000-2011	(3) 2008-2011	(5) 2010/2011	(2) 2000-2011	(4) 2008-2011	(6) 2010/2011
Population	0.583***	0.599***	0.688***	0.694***	0.764***	0.805***
	(0.0716)	(0.0988)	(0.0634)	(0.0793)	(0.0874)	(0.114)
Infant mortality	0.000719	-0.000422	-0.00498	0.000619	-0.00158	0.00114
	(0.00206)	(0.00324)	(0.00549)	(0.00160)	(0.00387)	(0.00209)
Birthplace leader	0.285*	0.273**	0.266*	0.00761	0.118	-0.0317
	(0.154)	(0.128)	(0.159)	(0.158)	(0.140)	(0.215)
Conflict deaths				-0.00165	-0.0210***	-0.194***
				(0.00142)	(0.00182)	(0.0371)
Number of observations (regions)	254	254	254	136	136	136
Number of countries	27	27	27	17	17	17

Robust standard errors clustered at country level in parentheses; country fixed effects included; *** p<0.01, ** p<0.05, * p<0.1.

Table 5 – PPML results for time-specific approach: World Bank projects

	(1) 2000-2011	(2) 2005-2011	(3) 2008-2011	(4) 2010/2011	(5) 2000-2010	(6) 2005-2010	(7) 2008-2010	(8) 2010
Population	0.593***	0.559***	0.601***	0.688***	0.715***	0.789***	0.873***	0.931***
	(0.0633)	(0.0699)	(0.0813)	(0.105)	(0.0682)	(0.103)	(0.133)	(0.118)
Infant mortality	0.000740	-0.000630	-0.000346	-0.00497	0.00101	-0.000130	-0.000173	0.00336
	(0.00240)	(0.00303)	(0.00341)	(0.00525)	(0.00205)	(0.00292)	(0.00470)	(0.00386)
Birthplace leader	0.125	0.212	0.240	0.265**	-0.0760	-0.0547	-0.104	-0.135
	(0.124)	(0.162)	(0.160)	(0.130)	(0.206)	(0.335)	(0.409)	(0.210)
Conflict deaths					-0.0184	-0.0328	-0.210***	-0.313***
					(0.0138)	(0.0430)	(0.0729)	(0.0669)
Number of observations	3,048	1.778	1,016	508	1,496	816	384	126
Number of countries	27	27	27	27	17	17	16	15
Number of regions	254	254	254	254	136	136	136	136

Robust standard errors clustered at regional level in parentheses; country and year fixed effects included; *** p<0.01, ** p<0.05, * p<0.1.

Table 6 – PPML results for time-specific approach: AfDB projects

	(1)	(2)	(3)	(4)
Population	0.575**	0.581**	0.575***	0.581***
	(0.261)	(0.265)	(0.222)	(0.221)
Infant mortality	-0.000890	-0.000963	-0.000890	-0.000963
	(0.00560)	(0.00544)	(0.00620)	(0.00588)
Birthplace leader	1.007**	0.987**	1.007*	0.987*
	(0.440)	(0.473)	(0.546)	(0.590)
Conflict deaths		0.0192		0.0192*
		(0.0118)		(0.0115)
Number of observations	298	268	298	268
Number of countries	18	16	18	16
Number of regions	149	134	149	134

Robust standard errors clustered at regional level in columns (1) and (2) and at country level in columns (3) and (4) in parentheses; country fixed effects and year dummy for 2010 included; *** p<0.01, ** p<0.05, * p<0.1.

Table 7 – PPML results for project-specific approach: World Bank projects

	(1) 2000-2011	(2) 2005-2011	(3) 2008-2011	(4) 2010/2011	(5) 2000-2010	(6) 2005-2010	(7) 2008-2010	(8) 2010
Population	0.591***	0.558***	0.600***	0.688***	0.721***	0.808***	0.902***	0.929***
	(0.0628)	(0.0700)	(0.0815)	(0.105)	(0.0710)	(0.0914)	(0.111)	(0.117)
Infant mortality	0.000685	-0.000671	-0.000251	-0.00499	0.00113	0.000377	-0,0000128	0.00328
	(0.00241)	(0.00306)	(0.00339)	(0.00525)	(0.00213)	(0.00297)	(0.00376)	(0.00387)
Birthplace leader	0.161*	0.186*	0.207*	0.263**	-0.116	-0.137	-0.182	-0.121
	(0.0926)	(0.103)	(0.122)	(0.128)	(0.102)	(0.131)	(0.168)	(0.203)
Conflict deaths					-0.00274	-0.0101	-0.182*	-0.314***
					(0.0124)	(0.0315)	(0.0967)	(0.0671)
Number of observations	6,686	4,884	3,127	1,814	2,168	1,077	538	381
Number of countries	27	27	27	27	17	17	16	15
Number of regions	254	254	254	254	136	136	128	126
Number of projects	518	365	237	147	239	123	65	45

Robust standard errors clustered at regional level in parentheses; country and project fixed effects included; *** p<0.01, ** p<0.05, * p<0.1.

Table 8 – PPML results for project-specific approach: AfDB projects

	(1)	(2)	(3)	(4)
Population	0.564**	0.579**	0.564**	0.579**
	(0.264)	(0.272)	(0.226)	(0.232)
Infant mortality	-0.000821	-0.00129	-0.000821	-0.00129
	(0.00560)	(0.00546)	(0.00621)	(0.00571)
Birthplace leader	0.980**	0.973**	0.980*	0.973*
	(0.440)	(0.471)	(0.543)	(0.583)
Conflict deaths		0.0228**		0.0228***
		(0.0102)		(0.00484)
Number of observations	710	671	710	671
Number of countries	18	16	18	16
Number of regions	149	134	149	134
Number of projects	69	63	69	63

Robust standard errors clustered at regional level in columns (1) and (2) and at country level in columns (3) and (4) in parentheses; country and project fixed effects included;*** p<0.01, ** p<0.05, * p<0.1

Appendix A – Sample countries with number of World Bank and AfDB projects, number of project locations and financial commitments

Recipient countries	World Bank			African Development Bank		
	# projects	# project locations	Commitments (US$ million)	# projects	# project locations	Commitments (US$ million)
Armenia	17	769	403.6			
Azerbaijan	18	248	2,230.0			
Bangladesh	21	725	3,818.7			
Benin	9	102	445.6	2	6	43.0
Bolivia	17	653	429.8			
Cambodia	7	49	158.0			
Cameroon	6	41	365.7	10	328	708.0
Central African Republic	6	33	263.9	5	162	47.0
Dem. Republic of the Congo	17	261	1,273.6	6	32	292.0
Ethiopia	12	142	1,441.7	3	47	362.0
Ghana	9	152	554.8	5	23	216.0
Haiti	16	279	272.1			
Honduras	11	258	250.7			
India	80	1,579	19,049.2			
Kenya	22	216	1,523.3	14	115	935.0
Lesotho	4	24	45.0	1	9	11.0
Liberia	11	98	126.6	3	27	39.9
Madagascar	4	16	15.6			
Malawi	9	118	154.0	5	27	126.0
Mali	10	136	403.4	4	10	102.0
Mozambique	10	84	407.6	6	31	241.0
Niger	4	31	220.0	1	4	25.5
Nigeria	17	511	1,945.9	6	26	341.0
Senegal	8	36	345.8	7	37	241.0
Togo	6	53	69.7	1	4	23.3
Uganda	15	247	650.6	6	51	568.0
Zambia	9	38	416.5	1	5	69.4

Note: Projects approved since 2005 and in operation as of September 2011 (World Bank) or projects approved in 2009 or 2010 (AfDB). The sum of the number of projects given in this table exceeds the total number of projects used in the analysis because some projects from the World Bank (10 projects) as well as from the AfDB (12 projects) are located in more than one country.

Appendix B – Sectoral distribution of World Bank projects in 27 sample countries (number of projects)

Sector	Number of projects
Public Administration, Law, and Justice	42
Production sectors	89
Agriculture, fishing, and forestry	71
Industry and trade	18
Physical infrastructure	126
Energy and mining	53
Finance	8
Information and communications	5
Transportation	60
Social infrastructure	108
Education	10
Health and other social services	42
Water, sanitation and flood protection	56

Note: Projects approved since 2005 and in operation as of September 2011. Coverage of sectors as given by AidData (notably, the combinations of "Industry and trade" as well as "Energy and mining"); "Energy and mining" subsumed by the authors under "Physical infrastructure" (rather than "Production sectors") as project descriptions in the source indicate a minor role of minerals, compared to energy.

Appendix C – Descriptive statistics: cross-section of the 2005-2011 period for the sample of World Bank projects and of 2009/2010 for the sample of AfDB projects

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
		Sample for World Bank projects			
Project locations	254	27.1	37.4	0	238
Population	254	6,563,890	17,500,000	52,525	166,000,000
Infant mortality	254	72.5	28.9	13.8	177.3
Maternal health	254	53.1	26.0	3.7	100.0
Malnutrition	254	24.5	12.2	0.4	60.3
Birthplace leader	254	0.09	0.26	0	1
Conflict deaths	136	4.5	15.1	0	130.5
		Sample for AfDB projects			
Project locations	149	6.3	14.3	0	121
Population	149	3,033,541	5,350,241	71,756	35,900,000
Infant mortality	149	85.0	25.1	32.5	177.3
Maternal health	149	49.9	25.0	3.7	97.8
Malnutrition	149	24.3	9.4	5.4	52.6
Birthplace leader	149	0.11	0.31	0	1
Conflict deaths	134	2.0	10.1	0	87.0

Appendix D – Definition of variables and data sources

Variable	Definition	Source
Project locations	Number of World Bank or AfDB project locations in a particular region, own calculations	AidData http://open.aiddata.org/content/index/geocoding (accessed: November 2011)
Population	Number of people living in a particular region, in log	http://www.geohive.com/cntry/ (accessed: November 2011)
Infant mortality	Infant mortality rate in a particular region: number of infants dying before reaching one year of age, per 1,000 live births in a given year.	World Bank http://maps.worldbank.org/content/country (accessed: November 2011)
Maternal health	Births attended by skilled health staff in a particular region (% of total).	World Bank
Malnutrition	Prevalence of child malnutrition in a particular region (% of children under five).	World Bank
Conflict deaths	Number of conflict-related deaths in a particular region per 100,000 inhabitants, own calculations	Uppsala Conflict Data Program (UCDP) http://www.ucdp.uu.se/ged/data.php (accessed: February 2013)

Appendix E – PPML results for time-specific approach: World Bank projects, standard errors clustered by country

	(1) 2000-2011	(2) 2005-2011	(3) 2008-2011	(4) 2010/2011	(5) 2000-2010	(6) 2005-2010	(7) 2008-2010	(8) 2010
Population	0.593***	0.559***	0.601***	0.688***	0.715***	0.789***	0.873***	0.931***
	(0.0714)	(0.0819)	(0.0989)	(0.0634)	(0.0850)	(0.105)	(0.0886)	(0.128)
Infant mortality	0.000740	-0.000630	-0.000346	-0.00497	0.00101	-0.000130	-0.000173	0.00336
	(0.00210)	(0.00278)	(0.00319)	(0.00548)	(0.00193)	(0.00351)	(0.00395)	(0.00320)
Birthplace leader	0.125	0.212**	0.240*	0.265*	-0.0760	-0.0547	-0.104	-0.135
	(0.130)	(0.105)	(0.123)	(0.159)	(0.0855)	(0.106)	(0.114)	(0.223)
Conflict deaths					-0.0184	-0.0328	-0.210***	-0.313***
					(0.0155)	(0.0490)	(0.0678)	(0.0401)
Number of observations	3,048	1,778	1,016	508	1,496	816	384	126
Number of countries	27	27	27	27	17	17	16	15
Number of regions	254	254	254	254	136	136	136	136

Robust standard errors clustered at country level in parentheses; country and year fixed effects included; *** p<0.01, ** p<0.05, * p<0.1.

Appendix F – PPML results for project-specific approach: World Bank projects, standard errors clustered by country

	(1) 2000-2011	(2) 2005-2011	(3) 2008-2011	(4) 2010/2011	(5) 2000-2010	(6) 2005-2010	(7) 2008-2010	(8) 2010
Population	0.591***	0.558***	0.600***	0.688***	0.721***	0.808***	0.902***	0.929***
	(0.0711)	(0.0823)	(0.0992)	(0.0635)	(0.0865)	(0.108)	(0.0861)	(0.128)
Infant mortality	0.000685	-0.000671	-0.000251	-0.00499	0.00113	0.000377	-1.28e-05	0.00328
	(0.00207)	(0.00281)	(0.00312)	(0.00549)	(0.00192)	(0.00349)	(0.00385)	(0.00326)
Birthplace leader	0.161	0.186*	0.207	0.263*	-0.116	-0.137	-0.182	-0.121
	(0.125)	(0.108)	(0.135)	(0.157)	(0.0942)	(0.117)	(0.114)	(0.215)
Conflict deaths					-0.00274	-0.0101	-0.182**	-0.314***
					(0.0134)	(0.0360)	(0.0832)	(0.0401)
Number of observations	6,686	4,884	3,127	1,814	2,168	1,077	538	381
Number of countries	27	27	27	27	17	17	16	15
Number of regions	254	254	254	254	136	136	128	126
Number of projects	518	365	237	147	239	123	65	45

Robust standard errors clustered at country level in parentheses; country and project fixed effects included; *** p<0.01, ** p<0.05, * p<0.1.